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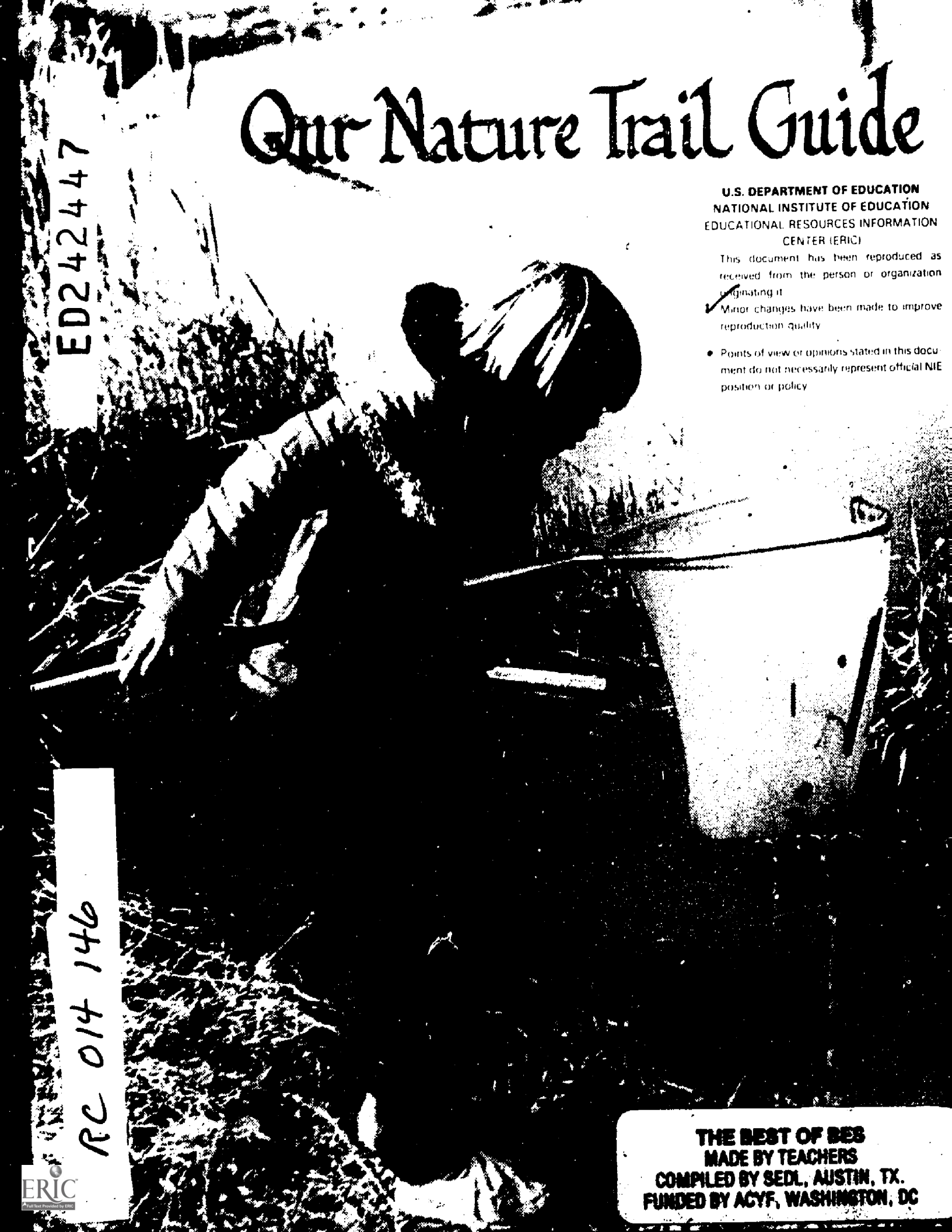
ABSTRACT

One of a series of documents produced by a nationwide network of early childhood education specialists, teachers, parents, and Head Start staff, this nature trail guide for exploring the outdoors is intended as a supplemental teaching aid for teachers or parents. The guide identifies and illustrates the most predominant and readily observable species found along trails and ponds of the western United States. An added feature of the guide is a brief geological history of the area, as well as a rock identification list. The document concludes with a list of tips for teachers and parents. Activities may be adapted for use at any grade level. (LH)

Our Nature Trail Guide



THE BEST OF BES
MADE BY TEACHERS
COMPILED BY SEDL, AUSTIN, TX.
FUNDED BY ACYF, WASHINGTON, DC

This guide is one of a number of curriculum, staff development, and parent involvement materials produced by the Ignacio BES Project.

The Basic Educational Skills Project was funded by a grant to the Southern Ute Community Action Programs from the Administration for Children, Youth, and Families. The Project goal was to demonstrate ways for Head Start programs and Elementary schools to coordinate their programs to provide developmental continuity for children.

Copies of this publication are available at the Ignacio Elementary School.

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Project Manager

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BASIC EDUCATIONAL SKILLS PROJECT
Southern Ute Children's Center and Ignacio Elementary School
Ignacio, Colorado
1982

HIT THE TRAIL

The Ignacio Elementary Nature Area Guide is a supplemental teaching aid for faculty and parents to use while exploring the school's outdoor learning ares with their children. By no means does it attempt to cover all phyla of living things in the Nature Area. It does attempt to identify and illustrate the most predominant and readily observable species along the trails and ponds. All the species herein have been used in teaching sessions in the area and are the most available for active learning enccunters.

The Guide provides distinct location maps depicting where species of plant and animals can be found. It also gives tips for appropriate learning experiences which teachers and parents may want to use. An added feature of this guide is a brief geological history of the area, as well as a rock identification list. A bibliography provides further references which are available at the School's Resource Room, public libraries, or local book stores.

We hope this guide will provide an opportunity for parents, teachers, and children to develop their natural curiosity and learn together as they explore the Nature Area.

Hit the Trail!

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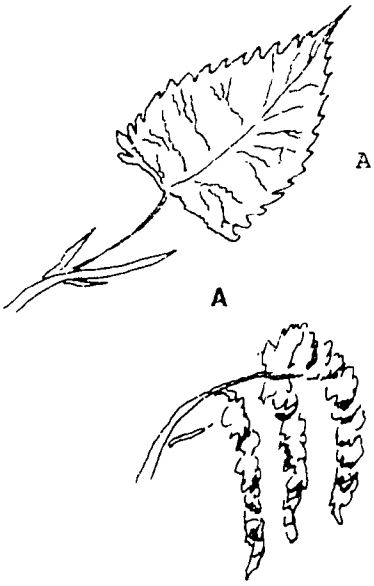
GREEN MACHINES

TREES

There are few species of trees in the Nature Area, largely due to the fact that this location had been used as a pasture for many years.



A

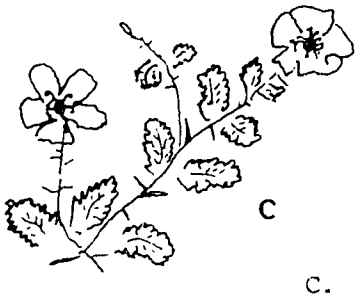
A. Cottonwood

The Cottonwood is the largest tree in the study area. Cottonwoods belong to the poplar family of trees, and their leaves turn bright yellow-orange in the Autumn. Cottonwoods are found along streams and rivers throughout Colorado.

B. Willow

In the Nature Study Area, there are three Willow species: Yellow, Red, and Gray. They can be easily identified by the color of their bark. All willows have catkin fruit, commonly known as "pussies". The willow provides food for beaver and deer.

B

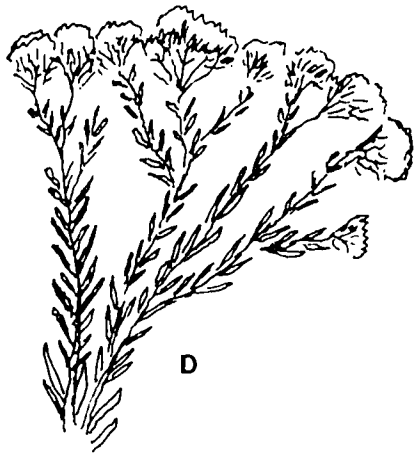


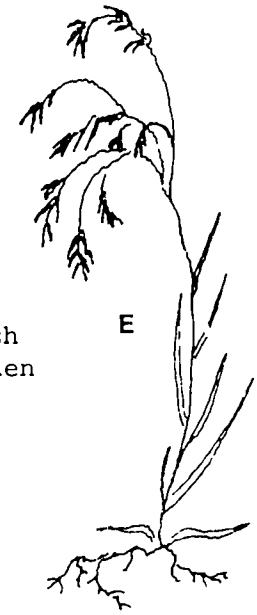
C. Wild Rose

The Wild Rose is a bushy plant that grows near the pond. The flowers are pink and the fruit is called "rose hips". They are eaten by many kinds of birds. The stems of these roses are thorny.

D. Golden Rabbit Brush

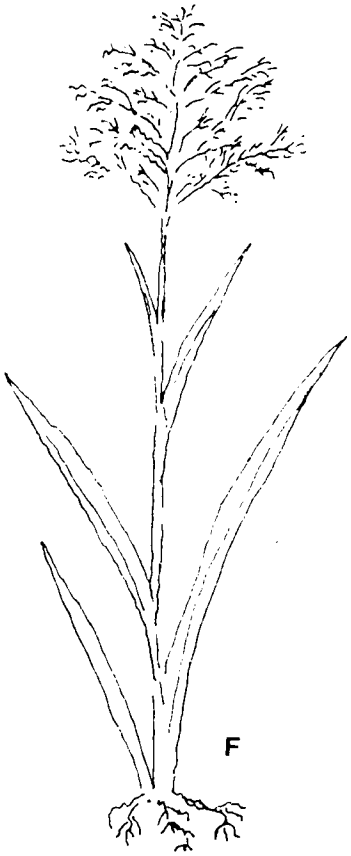
This plant grows as a small shrub with grey-green thin leaves. It is sometimes mistaken for sage. Golden Rabbit Brush blooms in late summer with yellow clustered flowers.





E. Blue-Eyed Grass

A fragile grass with blue or purplish leaf ends. This grass bends down when mature, and is bountiful along the pond in sunny areas.

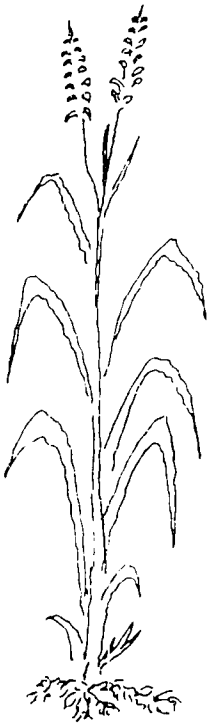


F. Reed Grasses

This grass has long flat leaves, plumelike flower clusters, and stiff stems. It can be found all along the pond and in the north marsh.

G. Cord Grass

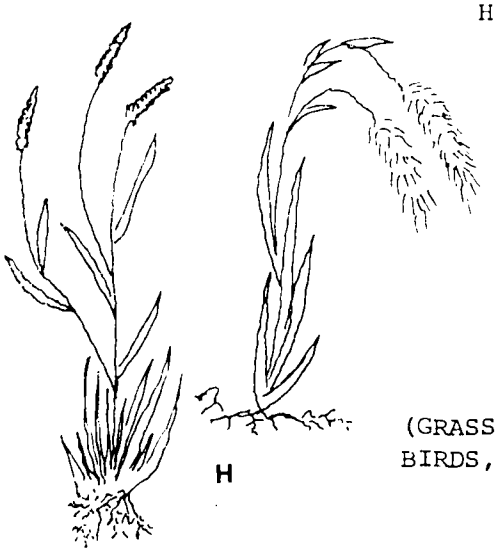
This large grass has straight stems and long, strong leaves. It grows in shallow water along the pond. Spikelets are found in rows. This grass has thinner leaves than the reed grasses.



G

H. Foxtails

The spikelets of this mature grass look like a bushy tail, sometimes long, sometimes short. It is found in dry areas on the Nature Trail.

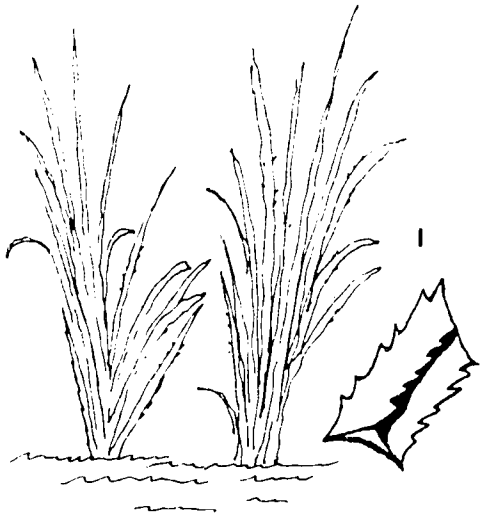


H

(GRASSES PROVIDE FOOD FOR INSECTS, BIRDS, RODENTS, AND DOMESTIC ANIMALS)

SEDGES

Sedges are grasslike plants with three-ranked leaves (three rows on stem). Stems are triangular in cross-section, unlike grasses, which are round.

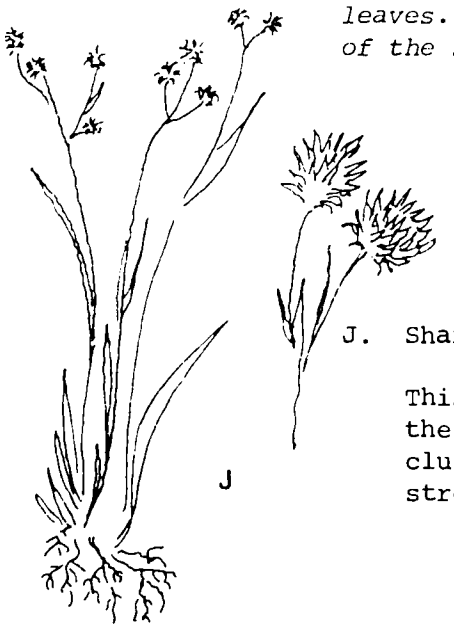


I. Sawgrass

Sawgrass is long grasslike sedge growing along the pond. The leaves have a sharp, spiney edge. Snakes like to hide and breed in this sedge.

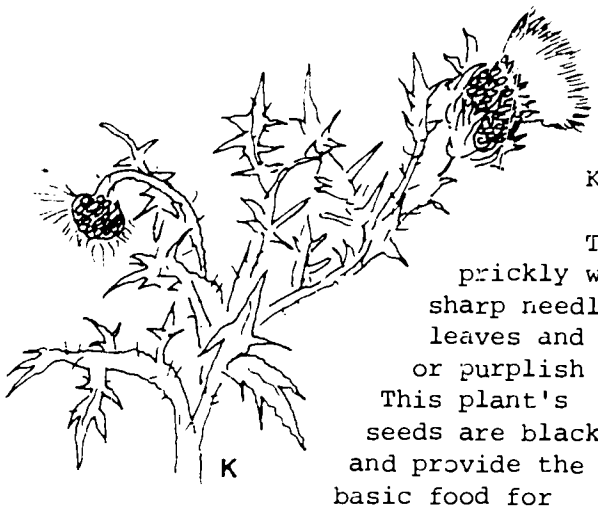
RUSHES

The Rushes have flattened , often hollow leaves. The fruit appear from the sides of the stem in clusters or from the top.



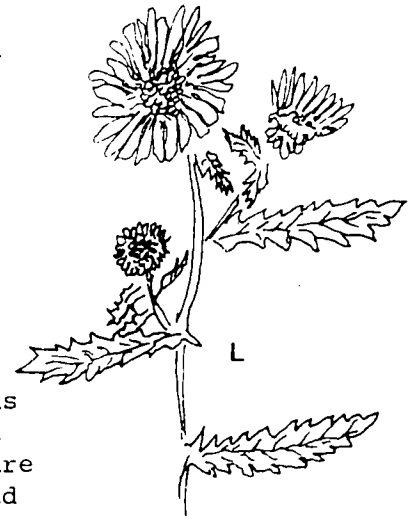
J. Sharp-Fruited Rush

This plant has cylindrical leaves and the fruit tops the plant in a brown cluster. Found near the banks of streams or ponds.



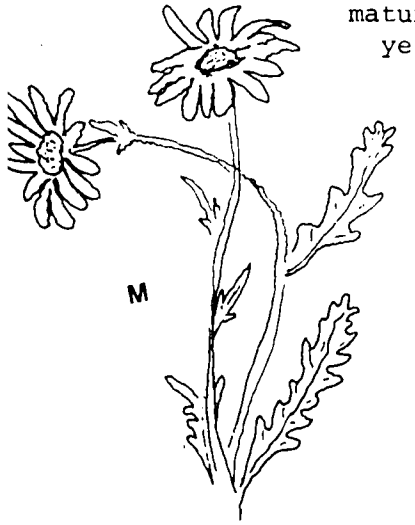
K. Canadian Thistle

The Canadian Thistle is a prickly wide-leaved plant with sharp needle-like spikes on the leaves and stem. It has a pinkish or purplish flower. This plant's seeds are black and provide the basic food for finches and other small birds.



L. Gumweed

This plant is a member of the sunflower family. It grows where soil has been disturbed, and stands about one foot high when mature. The flowers are yellow and sticky and appear in late summer and early fall.

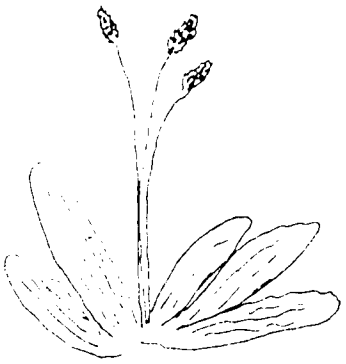


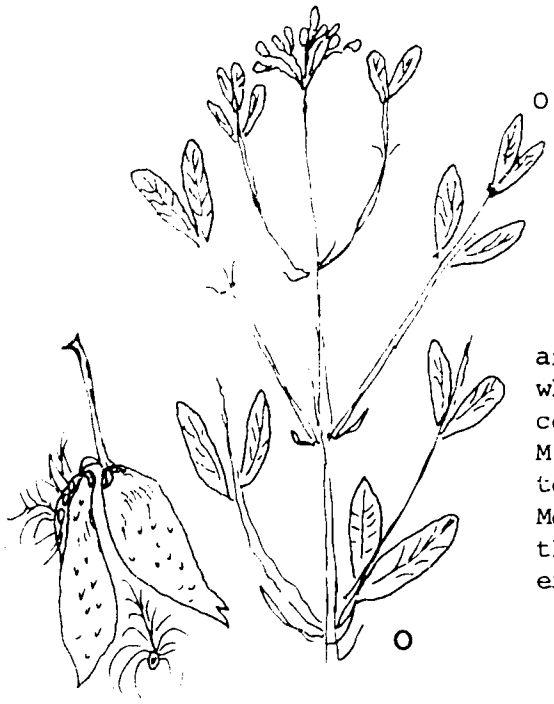
M. Daisy (Subalpine)

This is a pretty and common plant on the trails. It flowers in June and July. The narrow, pink and white ray of petals around a yellow disc makes it a favorite for ornamental reasons.

N. Plantain

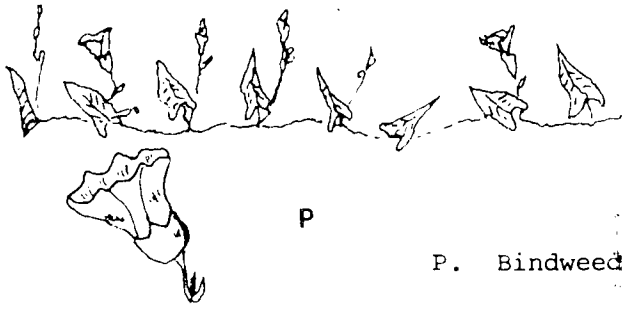
This plant has oblong leaves. The flower stem originates from the center of the plant and is topped with a brownish cone of seeds. It can be found among the grasses in the Nature Area of School Playground. Most people know it as a common lawn weed.





O. Milkweed

This plant can be found along the trails of the Nature Area. It has ovate leaves, and the entire plant turns somewhat red in the fall. The stems and leaves ooze a milky sap when broken. The seeds are cottonlike when cracked open. Milkweeds are very attractive to some butterflies, and the Monarch caterpillars feed on this plant and related species exclusively.



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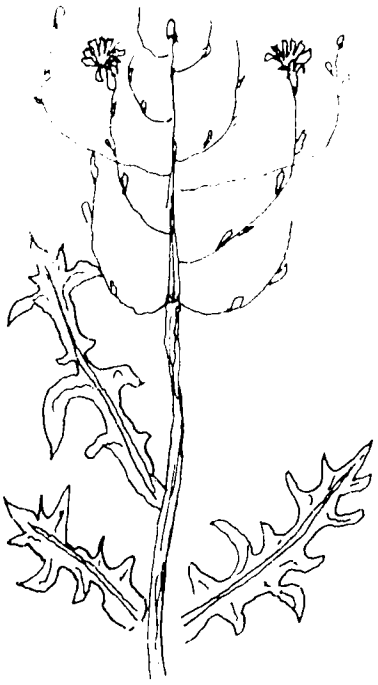
P. Bindweed

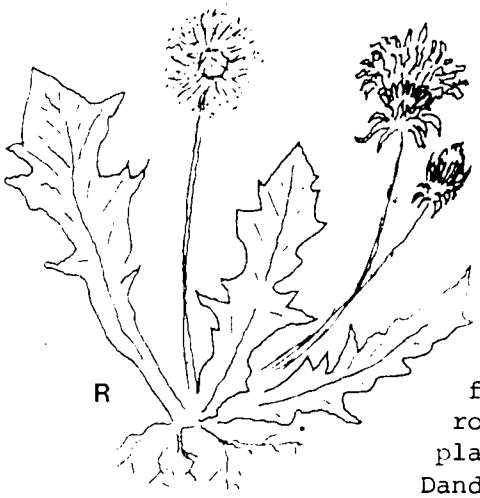
This plant is part of the morning glory family. It has pinkish-white flowers, and grows erratic vines along the ground. It is a common pest weed and tends to strangle other plants.



Q

Q. Wild Lettuce

This plant's leaves are much like those of the thistle, but with more hairlike needles. Wild Lettuce grows along the playground fencelines, and can reach two or three feet in height.



R. Dandelion

With small-toothed leaves, this plant grows almost everywhere and is our most predominant plant, other than the grasses.

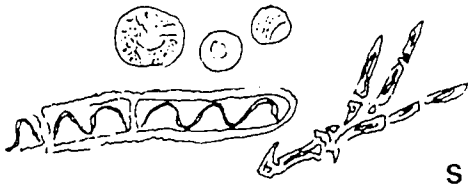
The flowers are soft yellow tufts. Dandelions provide food for birds, reptiles, and small rodents. Some species of this plant, such as the Tundra Dandelion, grow in circumpolar climates.

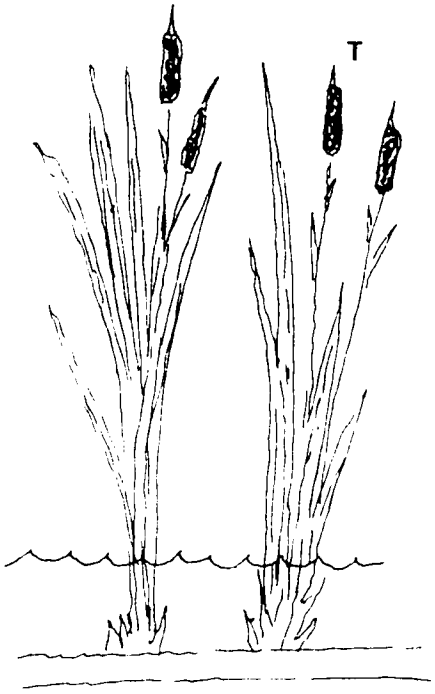
AQUATIC PLANTS

S. Green Algae

Algae are single-celled plants containing chloroplasts which help the plants produce food. They are usually found along shallow parts of the pond, in colonies.

Algae provide large portions of food for other aquatic life.



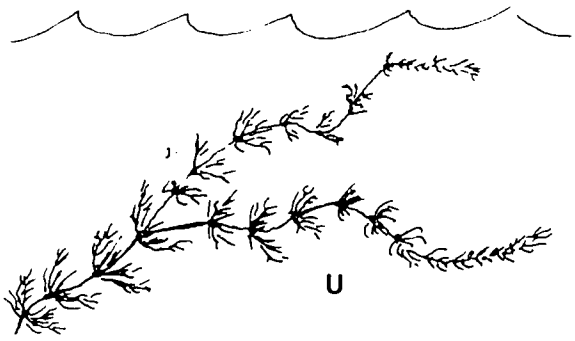


T. Cattails

Cattails flourish on both the north and the south ends of the large pond. The long slender leaves sometimes measure from six to eight feet in length. Cattails spread by wind-borne seeds and provide food and nesting areas for many birds. Its fruit looks much like a brown cigar.

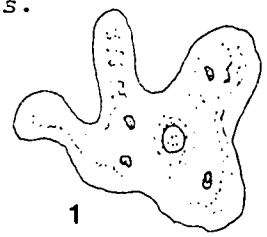
U. Hornwort

The Hornwort is the most plentiful plant growing in the pond waters. Its leaves are arranged in whorls. It is commonly free floating and its seeds provide food for waterfowl.



THE ANIMALS *(INVERTEBRATES)*

The Animals are represented in nearly all the major orders or phyla found in or around our fresh water ponds.



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PROTOZOA

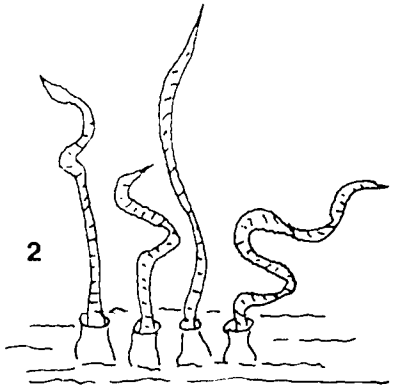
1. Amoeba

The amoeba is a microscopic, one-celled animal. The animal lives in water and feeds on other one-celled animals. These creatures are classified with other microscopic life in the phylum Protozoa. These Protozoa and algae provide one of the basic units of food within the food chain.

ANNELIDS

2. Tubifex Worm

This small worm is reddish in color, and attaches itself to the bottom of the pond. It is a major food source for fish and other aquatic animals.



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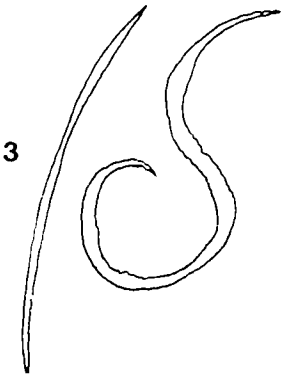
3. Nematodes

Nematodes are classified in the roundworm group. They live almost everywhere. There are about a thousand species of Nematodes. Some Nematodes are parasites and can be found in the stomach and intestines of fish.



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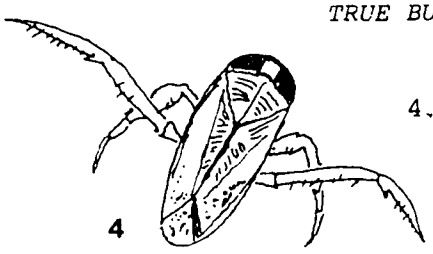
AQUATIC INSECTS

There are thousands of insects in North America that spend some of their time in water. Insects are identified by three major body parts, head, thorax, and abdomen. They also have three pairs of legs. Insects constitute a major part of the food source for many animals.

TRUE BUGS



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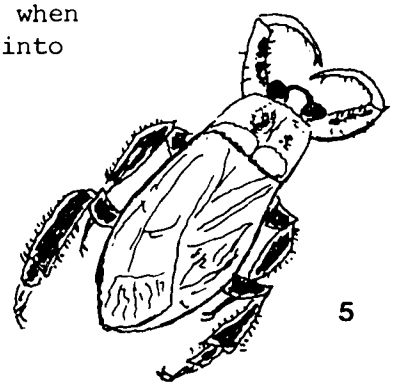
4. Water Boatman

These slender bugs with long hind legs flattened for swimming can be found rowing through the water. Air taken from the surface surrounds the insects when they are submerged. They feed on algae or decaying matter in the pond.

5. Giant Water Bug

Giant Water Bugs are the largest of the True Bugs. They feed on insects, tadpoles, and even small fish. They can bite, and when they do, they secreta a poison into their victim when they feed.



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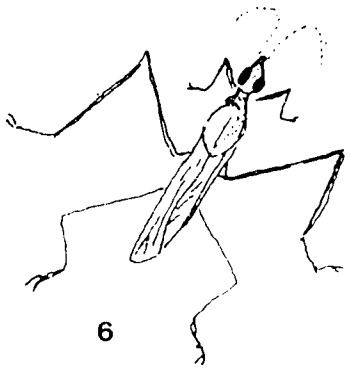
6. Water Strider

The Water Strider or Water Skipper is a long, slender, dark brown long-legged bug that jumps or skates across the surface of the water. It eats small insects from the water. The Strider is a major food source for fish.



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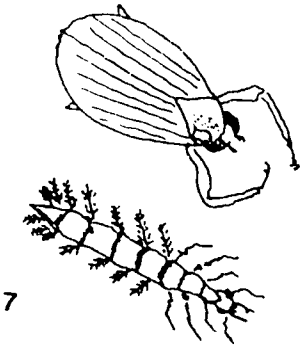

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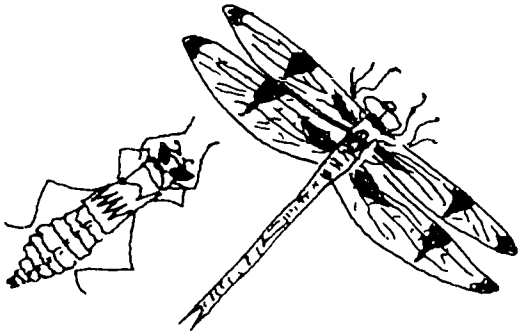
7. Whirligig Beetle

This animal gets its name from the whirling motion it makes on the surface of the water. It is black and shiny, and has eyes that are divided into two parts, to see above and below the water. The adult beetle eats debris, while the larva is carnivorous.

8. Dragon and Damselflies

There are about four hundred species of these insects. Dragonflies hold their wings horizontal when at rest while Damselflies hold their wings upward. The Green Darner is the largest dragonfly around the ponds. The Common Bluet (noticeable iridescent blue abdomen) is the most common damselfly living at the pond.



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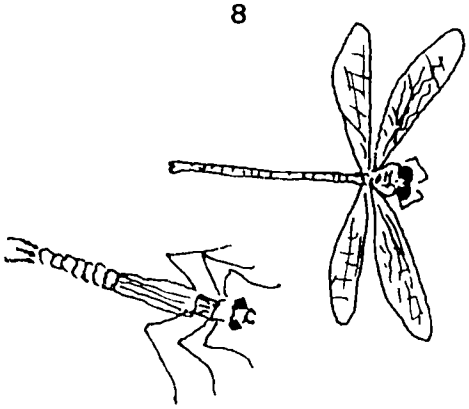
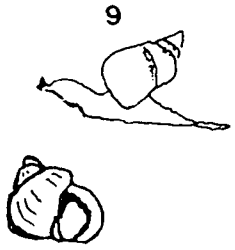


GASTROPODS

Gastropods are found in almost all aquatic environments. They have soft bodies and live in hard secreted shells.

9

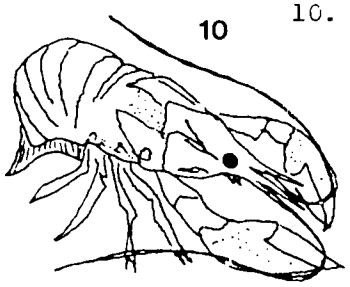


9. Little Pond Snail

This is a gilled snail which lives off the aquatic plants and algae floating in the pond. Gilled Snails are usually found on plants submerged in the water.

DECAPODA

This group of animals includes crayfish and fresh-water shrimp and their marine relatives such as crabs, lobsters, and marine shrimp.



10. Pond Crayfish

Crayfish are the most common bottom dwellers in our ponds. They feed on insects, debris, and even small minnows. During the dry season, they burrow into wet soil. Crayfish are related to spiders, and also to the marine lobster. The meat from their tails can be eaten.

VERTEBRATES

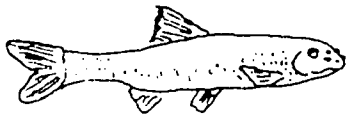
Vertebrates are the largest and best known animals found in the Nature Area. We have covered here only the most predominant of the many orders.

FISH (BONY)

Bony fish have scales, fins supported by rays and sleek bodies. They breathe through gills.

11. Creek Chub

This fish is the most common minnow found in the pond. It feeds on insects, and can be identified by the small bumps on its snout. The Chub will change color from silver white to striped black with gray bands.



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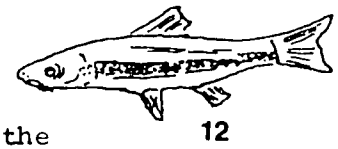
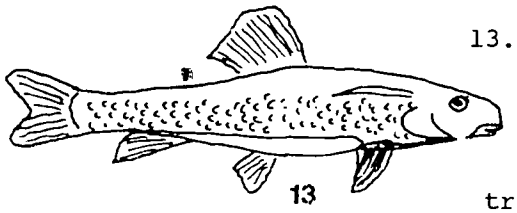
12. Brassy Minnow


12

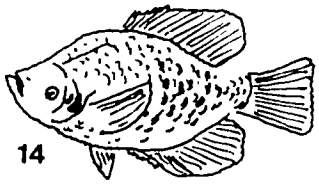
Another fish of the minnow family, the Brassy Minnow is smaller than the Chub and can be recognized by a greyish-black line along its side. The Brassy Minnow eats algae and small insects. Fishermen often use this minnow as live bait.


13

13. Common White Sucker

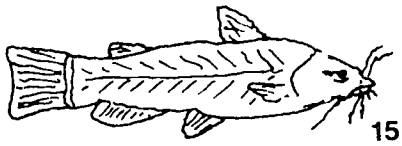
This fish is the largest specie found in the ponds. It is grey-white with a trace of green-blue on its fins and tail. It has a sucking mouth and feeds from the bottom of the pond. It is a scavenger fish.

14. Crappie


14

Crappie are a large specie of Sunfish, but in our ponds they are relatively small. They can be easily identified by their roundish bodies with black markings, especially around the gills. They feed on other small fish and insects.

15. Black Bullhead


15

This catfish is found in small schools in the large pond. It is a dark, scaleless fish with a sharp spine protruding from the dorsal (top) fin. Chin whiskers, or barbels, are sensory organs which help the fish find food. The Black Bullhead is usually a bottom feeder, but will eat other fish as it grows.

AMPHIBIANS

Amphibians are, with some exceptions, four-legged animals. Frogs and toads lack tails as adults. Newts and salamanders have tails. Amphibians live in wet areas as their skins are very sensitive and need moisture. These animals have three stages in their life: egg, larva or tadpole, and adult. The change amphibians go through is called, "metamorphosis".

16. Western Toad

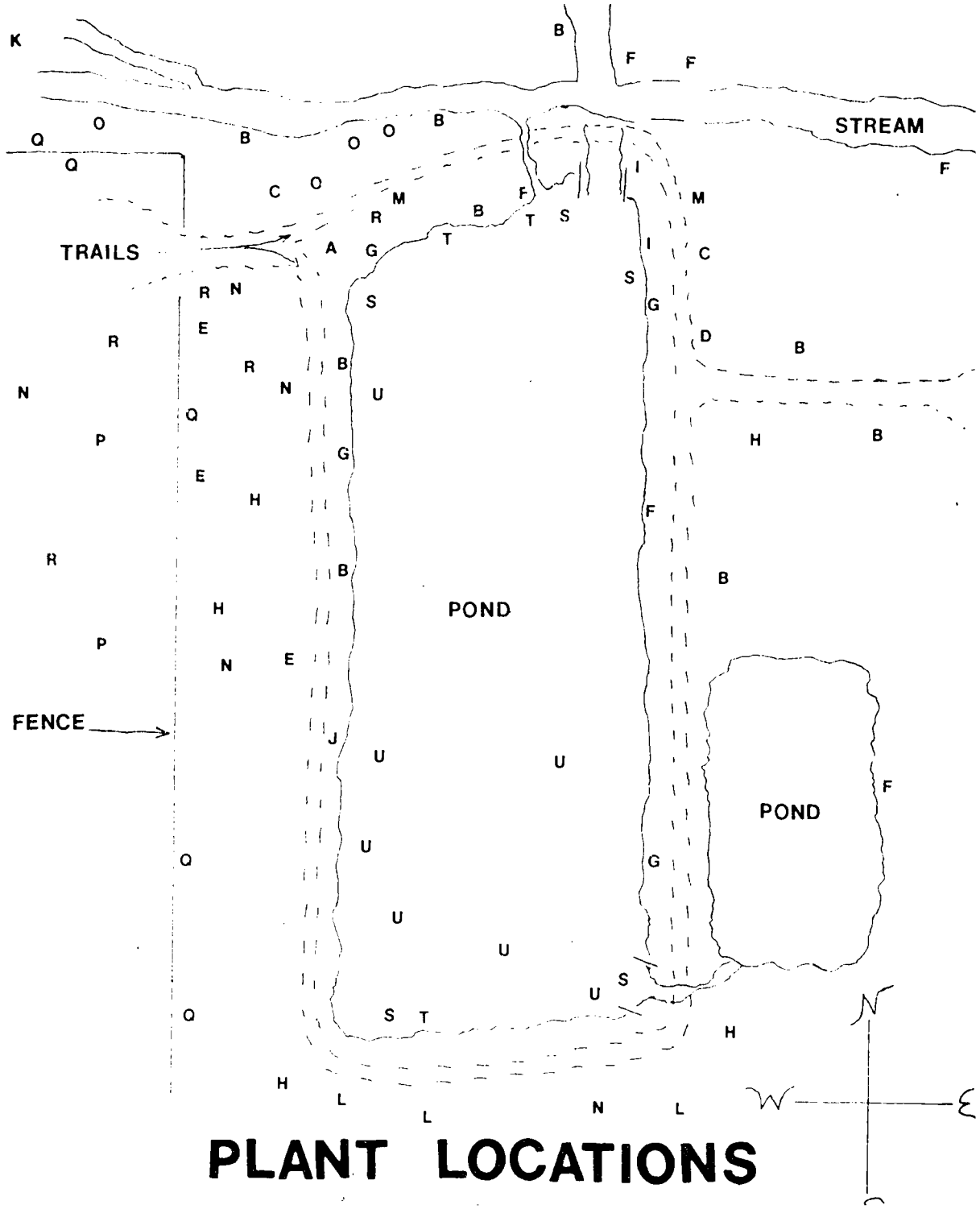
The Western Toad is a short terrestrial animal. It breeds in early summer and lays strings of eggs. It has a warty appearance, and the pupil of its eye is horizontal. The Western Toad's primary foods are insects and worms.


16

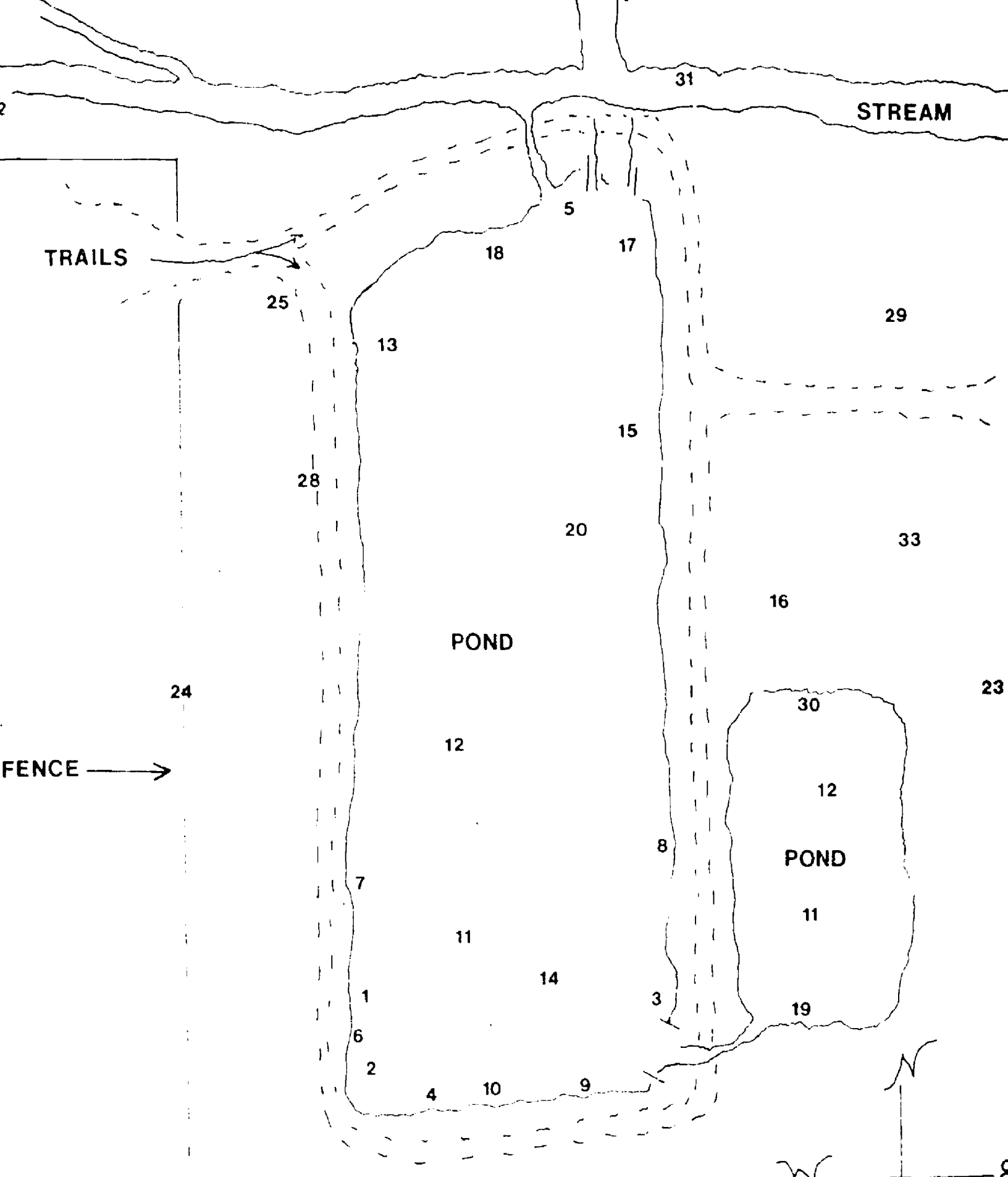
17. Leopard Frog


17

This jumper is the most common amphibian found in the pond. It is speckled with black spots on its green-brown body. This frog remains in the pond most of the summer and eats mosquitos and other insects. The Leopard Frog tadpole is yellow-green.



PLANT LOCATIONS

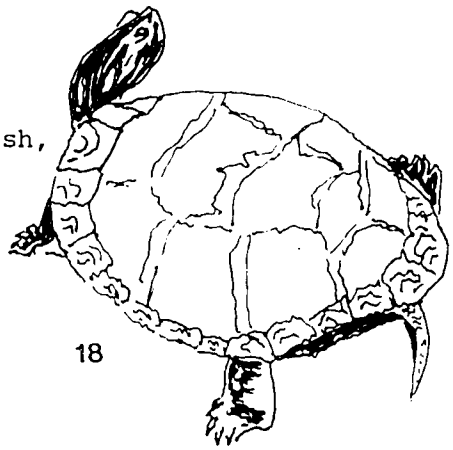


ANIMAL LOCATIONS

REPTILES

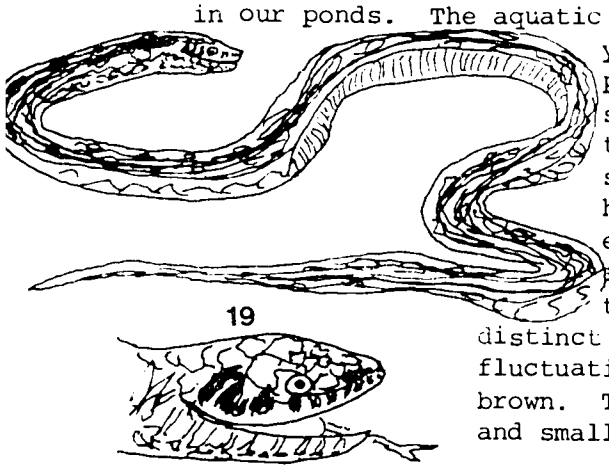
Unlike amphibians, reptiles are protected by horny plates or scales. Most reptiles lay eggs, some snakes produce live young. Most reptiles, except snakes, have two pairs of legs. All have teeth, except turtles. Reptiles may live in or out of water. Both amphibians and reptiles are cold-blooded, meaning their body temperatures adjust to climatic conditions.

18. Painted Turtle


18

The Painted Turtle is the largest and most often seen turtle in our pond. It feeds on insects, crayfish, fish, and aquatic plants. The turtle is protected by its shell, and burrows into the mud during the winter and hibernates. The Painted Turtle has distinct markings on the underside of its shell and neck.

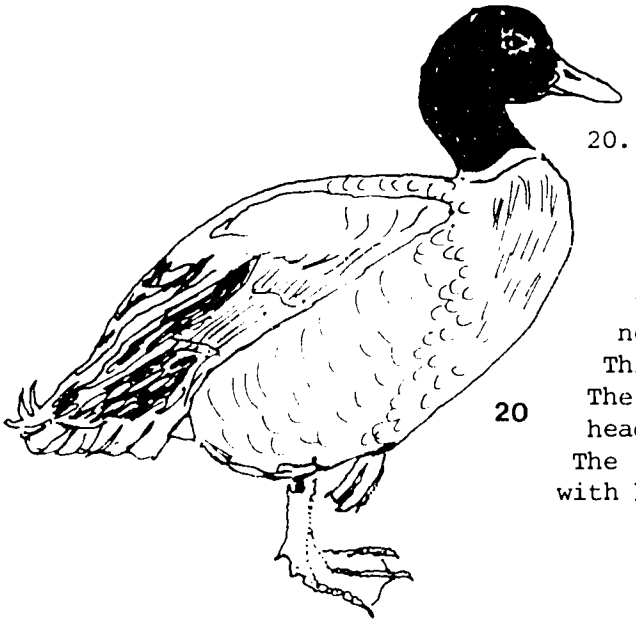
19. Garter Snakes


19

There are several species of Garter Snakes around and in our ponds. The aquatic types are brown with thin yellow or white lines running parallel to the length of the snake. They all have reddish tongues which they use for smelling. Garter Snakes are harmless and are caught easily. They feed on minnows and crayfish in the pond. The terrestrial types are more distinct in color and marking, fluctuating from green to yellow-brown. This specie feeds on insects, and small rodents.

BIRDS

There are hundreds of species of birds that migrate and use our Nature Area. Some live on the trails year-round. Only a few species will be identified in this guide.



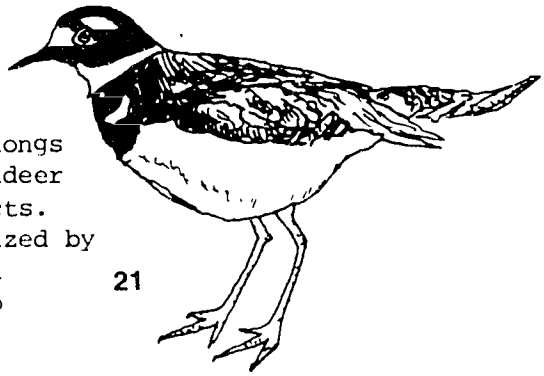
20

20. Mallard Duck

The Mallard is a surface feeding duck. Visiting our ponds in the Spring, the Mallard builds its nest in the willow thickets. This bird eats plant life. The male has a bright green head accented by a white ring. The female is less colorful, with brown speckled feathers.

21. Killdeer

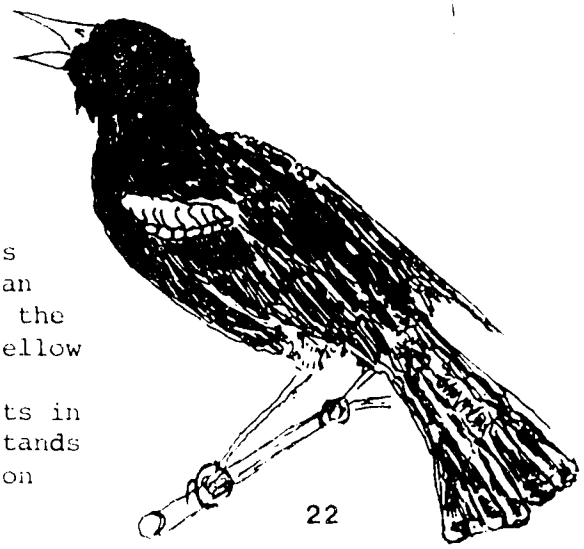
This bird can be found walking the banks of the Pine River near our ponds. This small bird belongs to the plover family. Killdeer feed on small aquatic insects. This bird is easily recognized by its "kill...deer" call. It makes it nest in weeds deep in the marshes.



21

22. Redwinged Blackbird

This bird is one of the most numerous of birds perching in the thickets around the ponds. It can easily be identified by the bright red patch with yellow trim on the wings. The Redwinged Blackbird nests in wet areas, usually in stands of cattails. It feeds on seeds and insects.

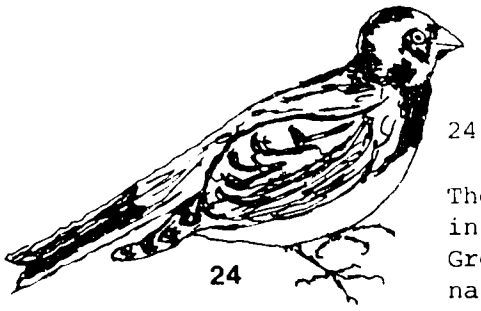


22

23

23. Magpie (Black-Billed)

One of the largest of the Western jay family, the Magpie lives in thickets in the pinyon forest. It builds its nest with sticks, and robs eggs from other birds' nests for food. It also eats small lizards, carrion, and insects. This large bird is black with slight iridescent green and a white patch on the wings.



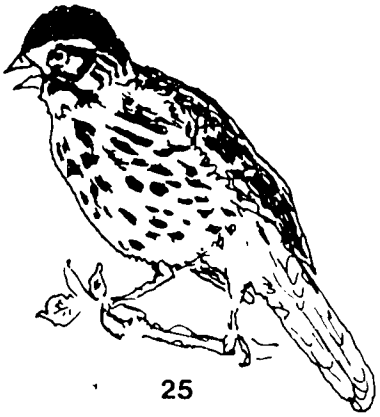
24

24. Junco

There are many variations of this bird in the Western United States. The Grey-headed Junco is the most predominant here.
It lives in old buildings, and thickets and eats seeds and insects. This bird is usually quite small and is a cousin to the Sparrow.
Its body is usually grey with a white underbelly and some brown on the wings.

25. Song Sparrow
and Other Related Species

This sparrow is one of many species of sparrow which inhabits the Southwest. It nests in thickets and house eaves. This bird is found all around the school. A Sparrow can be identified easily by the black and brown streaked markings on its wings and back. The breast is white with streaks of brown and black.



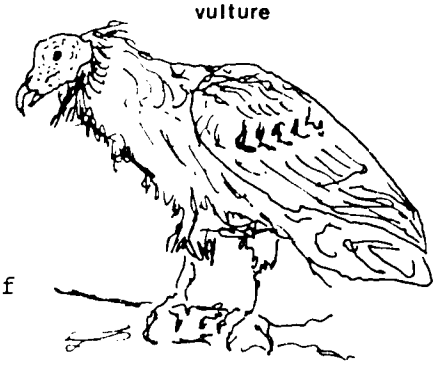
25

26. Great Blue Heron

This majestic bird
can be found
just east
of the pond,
near the cliff
area of the Pine
River's east bank.
It is a long-
legged wader with a
sharp bill and feeds
on aquatic animals
such as frogs and
fish. There are
many different
species of this
huge bird in North America.

26

27. Buzzards,
Eagles,
Hawks, and
Falcons


vulture

All these birds belong to the Raptor group of birds. "Raptor" refers to birds of prey having sharp curved bills and talons.

The Turkey Vulture is the most commonly seen bird flying high above the Nature Area. It has a huge wing span; red, unfeathered head; and yellow legs. Vultures, or buzzards, are Nature's garbage cleaners. They eat mostly carrion found in the hills or along the road. Some vulture species live for over seventy years.

At times, a Bald Eagle flies up the Pine River Valley. Our National Symbol, the Bald Eagle eats fish and small rodents. The adult male has a pronounced white head and black body. The female, and the immature male do not have the distinct white head, and are mostly brown.

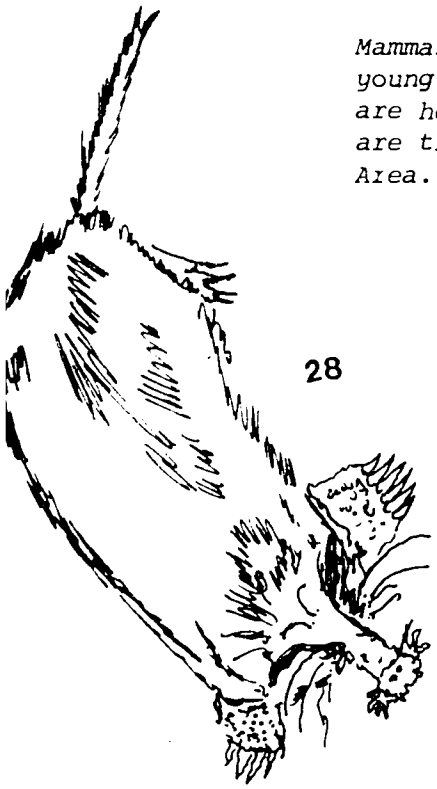

bald eagle

Hawks and Falcons are usually smaller than Eagles.

27

MAMMALS

Mammals are hairy animals which feed their young milk. They are warm-blooded. Some are herbivores, others are carnivores. They are the largest animals found in our Nature Area.



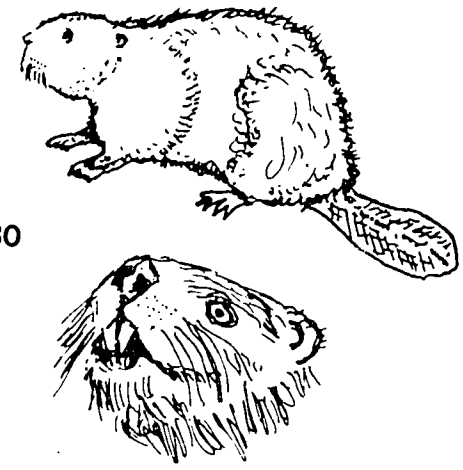
28. Star-Nosed Mole

This animal lives mostly underground and burrows for its meal of earthworms and insects. It is a small mammal, measuring just a few inches. Its nose is the shape of a star, and its mouth is below the snout to prevent dirt from impeding breathing. The Star-Nosed Mole is usually a brownish-grey color. Its tunnels and surface runs are found in many parts of the playground and Nature area.

29. Western Cottontail Rabbit

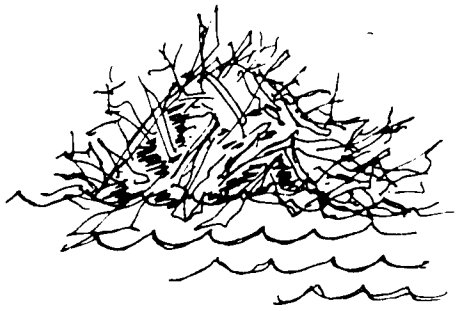
This rabbit specie lives throughout the drier areas of the Nature Area and feeds on plants along the ponds and trail. It is a large rodent, brown with large ears and a bushy white tail. In winter, it eats bark from small bushes and its fur turns from brown to grey-white. The Cottontail is a major source of food for coyotes and mountain lions.

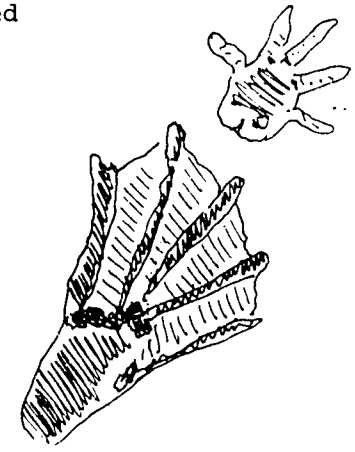
30. Beaver



30

There are several Beaver living in our Nature Area ponds. They are the largest North American rodent, and they have webbed hind feet adapted for swimming. Their wide flat tail aids in building dams, and is slapped against the water to signal danger. Our Beaver feed on the willow twigs which grow along the pond. The bark-stripped twigs along the pond banks identify feeding area. Beaver can be beneficial animals when they dam streams to preserve fresh water in high country. Beaver can get as large as three to four feet, and are not dangerous to humans. A large beaver lodge or home is located on the north end of the smaller pond. Lodges are made of twigs and mud constructed in a large sealed protective mound.





31

31. Muskrat

Muskrats are the second largest rodents found in the pond area of the Nature Trail. They are sometimes called "Water Rats" because they look like large rats. They are good swimmers, and feed on aquatic plants. Unlike beavers, Muskrats burrow into the banks of streams and ponds for living quarters. Sometimes they will make lodges out of reeds and grasses. Muskrats are smaller than beaver and have long skinny tails. They usually measure about two feet in length.

32. Prairie Dog (White Tailed)

This animal is found all along the Pine River area on higher ground. It is a rodent which feeds on seeds and grasses. It usually lives in colonies, and burrows deep in the ground, leaving a mound at the surface. It stands guard on the mound and utters a high-pitched bark when alarmed. The Richardson's Ground Squirrel is usually mistaken for a Prairie Dog. Though they look relatively the same, the Prairie Dog has a short tail, while the Ground Squirrel has a long one. Hawks and Eagles depend on Prairie Dogs for food.

32

meadow vole

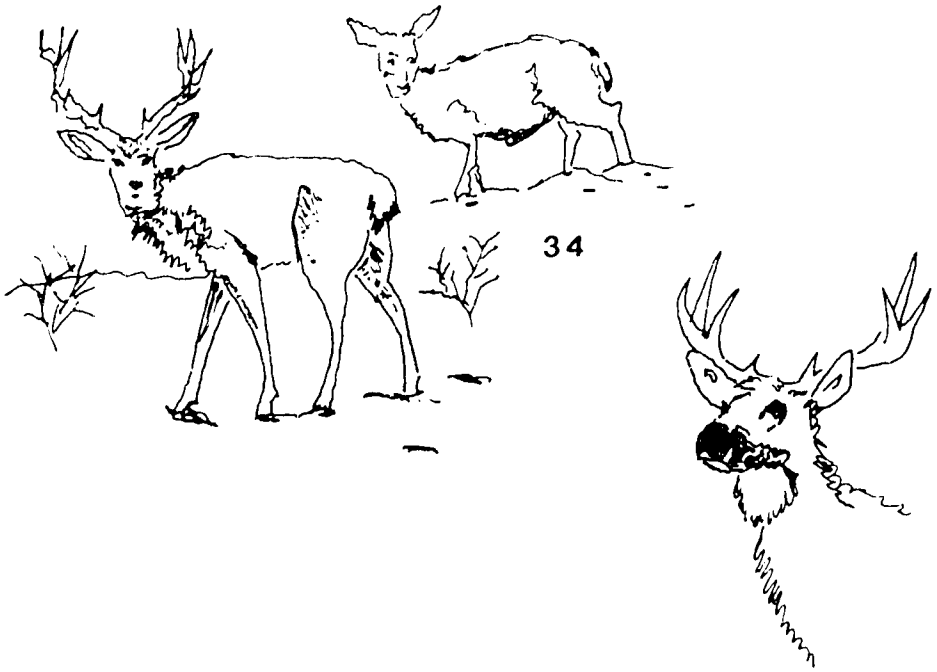
33. Meadow Vole

Another name for Meadow Vole is Meadow or Field Mouse. This mouse is one of the smallest and most numerous specie of rodent in the Nature Area. It can only be observed in the evening or early morning. It feeds on seeds from grasses and other plants. The Meadow Vole measures about five inches long as an adult. Relatives are the Jumping Mouse and White-Footed Mouse. These other species may also be spotted at times in the area. Mice provide a major food source for raptor birds and snakes.

white-footed mouse

34. Mule Deer

Mule Deer tracks are sometimes found along the Pine River area near the Nature Area. This shy animal comes down from high country, usually at night, to feed on tender willows and grasses. The Mule Deer is reddish-brown in summer, gray in Winter. It has mule-like ears and a large tail. It is hunted by man, coyote, and puma for food. The female lacks antlers, and is substantially smaller than the male.



37

GEOLOGY AND ROCKS

The Pine River Valley is part of a U-shaped valley which, during a certain geological epoch, was cut by slow-moving glaciers. Glacial valleys are burdened with till, which is debris from glacial erosion. Our valley is filled with boulders and large round stones pushed by ice and water during the course of thousands of years. The Nature Area is filled with water-eroded smooth boulders and stones. The ponds were man-made and filled by diverting water for domestic livestock in the recent past. The hills to the east of the school are filled with fossils representing many geological periods. Fossils are the imprint of ancient living things found in rock.

Geologists classify rocks into three groups. Examples from all three groups can be found in the Nature Area.

A. Igneous Rocks are formed when the hot molten material deep within the earth is forced to the surface and cools. Most of their minerals are in crystal form.


1


2

1. Granite is made of interlocking crystals of quartz, feldspars and mica. It is a speckled rock with white, black, and pink crystals. Some granites are grey, white and black.

2. Obsidian is volcanic glass, which is made from lava that has been cooled quickly. It is sometimes formed when lava is shot into the air. Arrowheads have been made from obsidian by local tribes because it can be flaked to form a sharp edge.

3. Basalt is a dark, dull stone. It may have holes in it that were made from gas bubbles when the stone was still hot.

4. Pumice is a light, frothy stone that was made when bubbling lava cooled. It looks like a hard sponge.

3

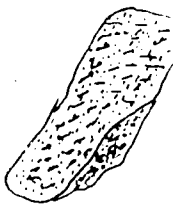
4

B. Metamorphic Rocks are made when heat, pressure, or chemical action alter the structure of already existing rocks.

1. Quartzite is a gray, long-grained shiny rock. It is made when sandstones are pressed into a new form.

2. Gneiss is an easily identified pinkish-white rock with intermittent lines of black throughout.

3. Marble is a white stone, most often used in constructing buildings. Marble is made when limestone, through heat pressure, changes its molecular composition.



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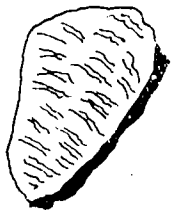

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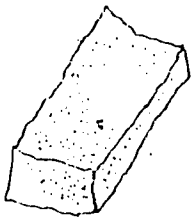
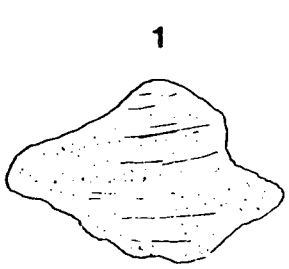
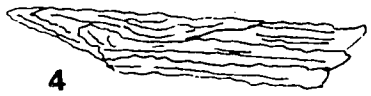


3

C. Sedimentary Rocks, the largest group of rocks found in our area. They are made from the broken parts of other rocks, cemented together by pressure through time. Most are made from sediments packed down for millions of years.





1. Yellow Sandstone is made from sand and is easily identified by its yellow or tan color. The sand grains are cemented by silica.

2. Red Sandstone is the same as above, but has some iron crystals which give the stone a reddish appearance.

3. White Sandstone is made from pressed ancient beach sand. White quartz crystals are easily seen in it.

4. Shale and Mudstones are made from hardened muds and clays. They are very fine-grained with gray, dark-brown, or black coloring.

5. Conglomerates are pebbles or larger fragments of stone cemented together to make one rock.

TIPS FOR TEACHERS AND PARENTS

1. Encourage children to plant vegetable and flower seeds outdoors or indoors. Show them how to care for plants and animals at home or in the classroom.

2. Collect leaves, stones, animal signs, and make nature collages, leaf rubbings, rock paintings.

3. Take a plant and animal hike. Identify and collect plant leaves, animal signs, pebbles, and fossils for displays at home or in school.

4. Draw plants and animals in their natural settings.

5. Start a garden at home or school. Explore how plants grow in different soils.

6. Encourage children to chart animal and plant observations in the field. For example, list number of species, kinds of nests, burrows, etc.

7. Enable children to explore animal and plant products.

8. Prepare a living system in the classroom or at home. Make your own terrarium from large jars. Set up an aquarium and fill it with minnows and other animals from local ponds and streams.

9. Make and keep your own Nature Diary.

10. Help children learn about the microscopic world by examining pond or stream water, soil or insect parts under the microscope, a hand lens, or magnifying glass.

11. Take a litter walk and explore the effects of pollution on your community.

12. Map an area. Use your own symbols.

13. Investigate with children the effect of erosion on land.

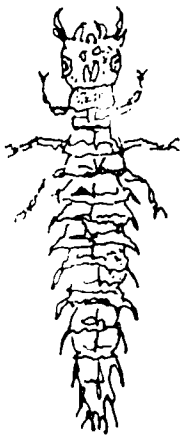
14. Explore Winter's effect on your environment.

15. Make plaster casts of animal tracks.

16. Encourage children to recycle items such as cans and paper.

17. Explore aspects of the weather with children. Set out a thermometer or a can raindrop collector.

18. Show children how to measure things in their environment using meter sticks, rulers, string, and measuring jars.



BIBLIOGRAPHY

Allen, Mae, Weeds, The Viking Press, New York, New York, 1978.

Burt, William, A Field Guide to the Mammals, Houghton Mifflin Company, Boston, Massachusetts, 1964.

Burton, Maurice, ed., The World Encyclopedia of Animals, T.Y. Crowell Company, New York, New York, 1972.

Nelson, Ruth A., Handbook of Rocky Mountain Plants, Skyland Publishers, Estes Park, Colorado, 1969.

Reid, George K., Pond Life (A Golden Guide), Golden Press, New York, New York, 1967. *

Shaffer, R.P., and Zim, H.S., Fossils (A Golden Guide), Golden Press, New York, New York, 1957.*

Shaffer, R.P., Rocks and Minerals (A Golden Guide), Golden Press, New York, New York, 1957. *

Smith, H.M., and Zim, H.S., Reptiles and Amphibians, Golden Press, New York, New York, 1956. *

Zim, H.S., The Rocky Mountains (A Golden Guide), Golden Press, New York, New York, 1964. *

* References which are available either in the School's Library or the Resource Room.